



Agenda Item 2: Analysis of Version 05 of the SAM ATS routes network and SAM-CAR inter-regional ATS routes

ANALYSIS OF VERSION 5 OF ROUTES NETWORK

(Presented by the Secretariat)

SUMMARY	
This working paper presents the deliverable of Version 05 of the SAM Region Routes Optimisation Programme, to be evaluated and completed by the experts in order to prepare the concerning implementation plan, based on the needs of users and feasibility of States, taking into consideration PBN capacity of aircrafts.	
References:	
<ul style="list-style-type: none">• ATS/RO meetings reports• SAM/IG meetings reports• SAM Region CONOPS PBN - Period 2018-2020	
ICAO Strategic Objectives:	<i>A - Safety</i> <i>D - Economic Development of Air Transport</i> <i>E - Environmental protection</i>

1. Introduction

1.1 As part of the actions approved by the Twelfth Meeting of the Coordination Committee of Project RLA/06/901 (RCC/12) for 2019 regarding the PBN implementation programme, the services of ATS specialists of the SAM Region and one specialist of the CAR Region were requested for the development of “Version 5 of the SAM route network in accordance with the PBN concept of operations”, within the framework of Project RLA/06/901. The tasks involved were as follows:

- a) Draft a technical document and planning forms for the implementation of the fifth version of the SAM route network, applying the PBN concept of operations (CONOPS) and analysing the main air traffic flows to identify improvements leading to the realignment of ATS routes, the replacement or cancellation of conventional routes, the modification of PBN navigation specifications and the use of parallel routes, among other advanced concepts.
- b) Analyse and identify improvements in the ATS route interface at SAM and CAR FIR boundaries.

c) Propose the corresponding implementation timetables.

1.2 The working group consisted of Messrs. José Gonzales, Marco Vargas, and Cesar Turcios, from the administrations of Venezuela, Peru and COCESNA, respectively, and conducted its activities between 11 February and 1 March 2019 at the SAM Regional Office. Also, support was received from specialists; Mr Tomas Macedo (CORPAC S.A) and Mr. Eloy Tafur (DGAC PERU).

2. Discussion

2.1 The group prepared the work plan, defined the objectives and scope of the project, and agreed on the following planning criteria, covering regional and interregional (CAR/SAM) route segments, as follows:

- Replace conventional regional routes with RNAV regional routes, considering a future exclusionary RNAV 5 upper airspace by 2020.
- More direct routes must consider the IAF or TMA gateways instead of aligning routes with the ARP.
- Parallel RNAV routes must be implemented when operational benefits can be derived (*e.g.*, significant air traffic movement, separation of flows to airports in the same TMA, etc.). Assess implementation of RNP2 and RNP4 specifications.
- Consider those routes that had been planned in previous Version 4 implementation stages, which, for various reasons, could not be implemented.
- Consider restricted airspace as flexible use airspace.

2.2 The conventional routes remaining in the Region were analysed. It was proposed that they be eliminated and replaced with new RNAV routes to improve paths, or that the existing RNAV routes be modified as appropriate.

2.3 Regarding the implementation of parallel routes in accordance with the CONOPS, route convergence points were identified over MITU (MTU) and SAN ANDRES (SPP), which could be optimised through route realignment to obtain RNP2 parallel or almost parallel routes, and maintaining their interconnectivity.

2.4 Coordination took place with experts of Ecuador, Colombia, Chile, Brazil, and Panama. Coordination also took place with IATA.

2.5 Seven route optimisation proposals were received from IATA, 2 of which were in the SAM Region and 5 in the CAR Region. The proposals were analysed and taken into consideration. The specialist Cesar Turcios took note of the proposals for their analysis in the ANI/WG PBN/TF (see paragraph 3.5 below).

2.6 Work planning and development tools were used, namely the Skyvector flight planner (available on the internet), updated DOD charts, the Navigraph application for searching routes, Excel spread sheets, and online queries of available AIPs when needed.

2.7 A debate took place on the DIRECT ROUTING and FREE ROUTING AIRSPACE operational concepts, as part of the operational improvements in en-route flight paths (FRTO) according to the GANP version 2019. IATA requested that consideration be given to prompt implementation of FRA and UPR in the SAM Region, taking into account that some FIRs had already been implemented, which was not in line with the GANP 2019.

3. **Results**

3.1 Version 5 of the SAM route network contains fifty-one (51) proposals. An Excel workbook file was shared with States, focal points, ANSPs, and industry representatives.

Note. - Added to version 5, during ATSRO/10 additional proposals presented by states and industry will be discussed.

3.2 Proposals include;

- a) Elimination of 37 conventional regional routes.
- b) Elimination of 2 RNAV regional routes for purposes of optimisation and harmonisation.
- c) Implementation of 27 new RNAV routes.
- d) Modification of 15 RNAV routes, involving realignment, extension, or reduction of existing RNAV routes.
- e) 21 proposals involve flight mile reductions and, if all of them were implemented, a total reduction of 178 NM of flight would be obtained.

3.3 Of the 51 proposals contained in version 5 of the SAM route network, 32 correspond to the CAR/SAM route interface, and 19 of the proposals correspond to the SAM Region. 19 proposals correspond to SAM Region, organized in two groups; 12 for Pacific sector and 07 for Atlantic sector, as shown;

States/Organization		Proposals groups
Ecuador Panamá Colombia Venezuela Guyana Surinam Guyana Francesa Trinidad y Tabago Puerto Rico	Curacao Jamaica República Dominicana Cuba COCESNA	CS-5-01 a CS-5-32
Ecuador Perú Chile Bolivia		PA-5-01 a PA-5-12
Brasil Uruguay Argentina Paraguay		AT-5-01 a AT-5-07

3.4 In order to facilitate the organization of ATSRO/10 activities, a table with distribution of States concerned for each proposal is shown;

Estados	PROPUESTAS																			
	PA 5-12	AT 5-02	ATS-04	AT 5-05	AT 5-06															
Argentina																				
Brasil	CS 5-02	CS 5-03	CS 5-05	CS 5-23	PA 5-08	PA 5-09	PA 5-10	PA 5-11	PA 5-12	AT 5-04	AT 5-07									
Bolivia	CS 5-23	PA 5-12	AT 5-05	AT 5-06																
Chile	AT 5-02																			
Colombia	CS 5-07	CS 5-10	CS 5-19	CS 5-20	CS 5-21	CS 5-22	CS 5-23	CS 5-26	PA 5-01	PA 5-02	PA 5-03	PA 5-04	PA 5-05	PA 5-06	PA 5-07	PA 5-08	PA 5-10	PA 5-11	PA 5-12	
Ecuador	CS 5-10	CS 5-31	CS 5-32	PA 5-02	PA 5-04	PA 5-11														
Guyana	CS 5-01	CS 5-02	CS 5-03	CS 5-04	CS 5-05	CS 5-06														
Guyana Francesa	CS 5-02	CS 5-03	CS 5-05	AT 5-01	AT 5-03															
Panama	CS 5-22	CS 5-23	CS 5-24	CS 5-25	CS 5-26	CS 5-27	CS 5-28	CS 5-29	CS 5-30	PA 5-01	PA 5-03	PA 5-05	PA 5-06	PA 5-08						
Paraguay	CS 5-23																			
Peru	CS 5-23	PA 5-07	PA 5-09	PA 5-11	PA 5-12															
Suriname	CS 5-02	CS 5-03	CS 5-04	CS 5-05																
Uruguay	AT 5-04	AT 5-07																		
Venezuela	CS 5-07	CS 5-08	CS 5-09	CS 5-10	CS 5-11	CS 5-12	CS 5-13	CS 5-14	CS 5-15	CS 5-16	CS 5-17	CS 5-18	CS 5-19	PA 5-05	PA 5-06					

3.5 In order to implement the routes proposed in version 5 of the SAM Route network and the CAR route optimisation plan, the working group proposed the following joint plan:

	CAR REGION	SAM REGION
Meeting of States for discussion and approval	TBD at the ANI/WG/PBN/TF 22 - 25 April	ATSRO 10 17 - 21 June 2019
CAR/SAM teleconference 1 - follow up on implementation with States	May 2019	July 2019
CARSAM teleconference 2 - confirm publication dates of all States	June/July2019	August 2019
Publication dates of all States	12 September 2019	12 September 2019
Effective date	5 December 2019	5 December 2019

3.6 The ANI/WG (PBN/TF) PBN task force of the CAR Region met on 22-25 April at the NACC Office in Mexico. The 32 proposals of version 5 that involve CAR/SAM international airspace were analysed. 19 proposals were found feasible and it is expected that the CAR States involved will participate in ATSRO/10 in order to consolidate the route implementation plan and improve coordination for effective implementation. The results of the PBN/TF meeting will be posted on:

<https://www.icao.int/NACC/Pages/meetings-2019-pbn.aspx>

4. **Suggested action**

4.1 The Meeting is invited to:

- a) Take note of the information provided herein and analyse the version 5 deliverables in the ad-hoc groups; and
- b) propose improvements for the development of the implementation plan and future route optimisation activities, and provide feedback on the proposed dates for the implementation of version 5.
